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The Terrestrial Isopod Genus *Periscyphis* (Oniscidea: Eubelidae) in Egypt and Israel

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With 28 figures

Summary

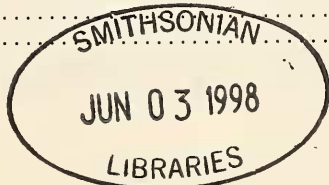
Periscyphis albus n. sp. from desert localities in southern Israel and the Sinai is described and figured. *P. convexus* from the Nile valley in Egypt and Sudan is redescribed, with figures of diagnostic characters. The available data for two additional species recorded from Egypt, *P. subtransversus* and *P. albescens*, are added. An identification key for all species of *Periscyphis* known up to date from Egypt, Israel and the Arabian Peninsula is provided.

Zusammenfassung

Periscyphis albus n. sp. vom Sinai und aus der Negev-Wüste im südlichen Israel wird beschrieben und abgebildet. *P. convexus* aus dem Nil-Tal in Ägypten und im Sudan wird nachbeschrieben, die diagnostischen Merkmale werden abgebildet. Die verfügbaren Daten von zwei weiteren Arten aus Ägypten, *P. subtransversus* und *P. albescens*, wurden zusammengefaßt. Ein Bestimmungsschlüssel für alle bisher aus Ägypten, Israel und von der Arabischen Halbinsel bekannten *Periscyphis*-Arten ist beigefügt.

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1. Introduction

Thanks to the recent investigations of FERRARA and TAITI the extremely interesting terrestrial isopod genus *Periscyphis* is exceptionally well known concerning systematics, distribution, morphology, biology and ecology, as compared with other isopod taxa. Systematics, morphology and distribution of the genus on the Arabian Peninsula have been treated in FERRARA & TAITI (1986, 1988, 1990, 1996), TAITI & FERRARA (1989, 1991), and TAITI & alii in press. The discovery of a new species in the southern Negev desert and on the Sinai was an opportunity to give in the present paper a redescription of the very similar *Periscyphis convexus* recorded from Egypt, together with the description of the new species. The mutilated type-material of *P. subtransversus*, doubtfully collected somewhere in Egypt, was also re-examined. The type of a third species recorded from Egypt, *P. albescens*, was unretrievable. This species is, however, recognizably described and figured by OMER-COOPER (1926). The only further record of the genus from northern Africa is *Periscyphis libycus* Arcangeli, 1934 from the oasis of Kufra in southeastern Libya (ARCANGELI 1934). This species is certainly different from the four species herewith recorded from Egypt.

2. The genus *Periscyphis* Gerstaecker, 1873

Type-species: *Periscyphis trivialis* Gerstaecker, 1873.

Diagnosis of the genus *Periscyphis*, compared with other genera of the family Eubelidae (according to FERRARA & TAITI 1982):

1. Two-jointed antennal flagellum;
2. Endite of maxillula equipped with only two penicils;
3. Pleopod-exopodites I and II (and only these, in contrast to the genus *Xeroniscus* Ferrara & Taiti, 1990) with tubuliform lungs that terminate in an extremely narrow cleft (FERRARA & alii 1991);
4. Pereion-epimera I with or without sulcus arcuatus;
5. Pereion-epimera I without schisma or ventral tooth.

The genus *Periscyphis* in this definition contains now 39 described species (TAITI & alii in press, FERRARA & TAITI 1996, DALENS 1996). They are distributed in eastern Africa from Tanzania to Egypt and in the Arabian Peninsula, with the northernmost records from Cairo, the Sinai and the southern tip of Israel. The westernmost record is from the Mandara Mts. in northern Cameroon (DALENS 1996), and one species is known from the oasis of Kufra in Libya. A list of these species, with distribution areas, is given in the cited paper. All species live in arid or semi-arid biotopes. In an identification key we treat the species known from Egypt, Israel and the Arabian Peninsula.

3. The *Periscyphis*-species in Egypt and Israel

3.1. *Periscyphis albescens* (Budde-Lund, 1885)

Cercocytonus albescens: BUDDE-LUND 1885: 43.

Periscyphis (sic) *albescens*: BUDDE-LUND 1885: 293.

Periscyphis albescens: BUDDE-LUND 1909: 9, plate I, figs. 26–28;
 OMER-COOPER 1926: 376, figs. 42–45;
 ARCANGELI 1940: 385;
 PAULIAN DE FÉLICE 1945: 342;
 VANDEL 1964: 735;
 LEWIS 1966: 10;
 FERRARA & TAITI 1979: 135;
 TAITI, FERRARA & ALLSPACH in press.

Periscyphis (Periscyphis) albescens: STROUHAL 1965: 624.

The species was described after one single ♀, which according to BUDDE-LUND (1885: 43) was located in the Zoological Museum in St. Petersburg. This specimen is unretrievable, according to Dr. S. VASILENKO (in litt. 1995). In a later publication (BUDDE-LUND 1909: 9) the same author reports the species from Cairo and Khartum. Supposedly based on this material, OMER-COOPER (1926: 376) gives a redescription of the species with figures of pereion-epimere I, pleon, male pereiopod VII and male pleopod I. By these figures the species is recognizably characterized.

Distribution

Egypt: Without locality (BUDDE-LUND 1885), Cairo (BUDDE-LUND 1909).

Sudan: Khartum (BUDDE-LUND 1909, STROUHAL 1965, LEWIS 1966); Nubia, desert at Abd el Quadir (STROUHAL 1965).

3.2. *Periscyphis albus* n.sp.

Holotype: ♂, Israel, Negev 12 km NW Elat, above En Netafim, 600 m, wadi with scattered vegetation, leg. SCHAWALLER & SCHMALFUSS 17. II. 1987 (SMNS T 354).

Paratypes: 2 ♂♂, 1 ♀ without marsupium, Egypt, Sinai, “Ein-Chadjet” leg. SHULOV 24. IV. 1968 (SMS T 355: 1 ♂, 1 ♀; TBH: 1 ♂); – 2 ♂♂ in poor condition, Egypt, Sinai, “Watiya Pass”, leg. TSABAR 18. VII. 1968 (TBH).

Collecting localities see map. fig. 28.

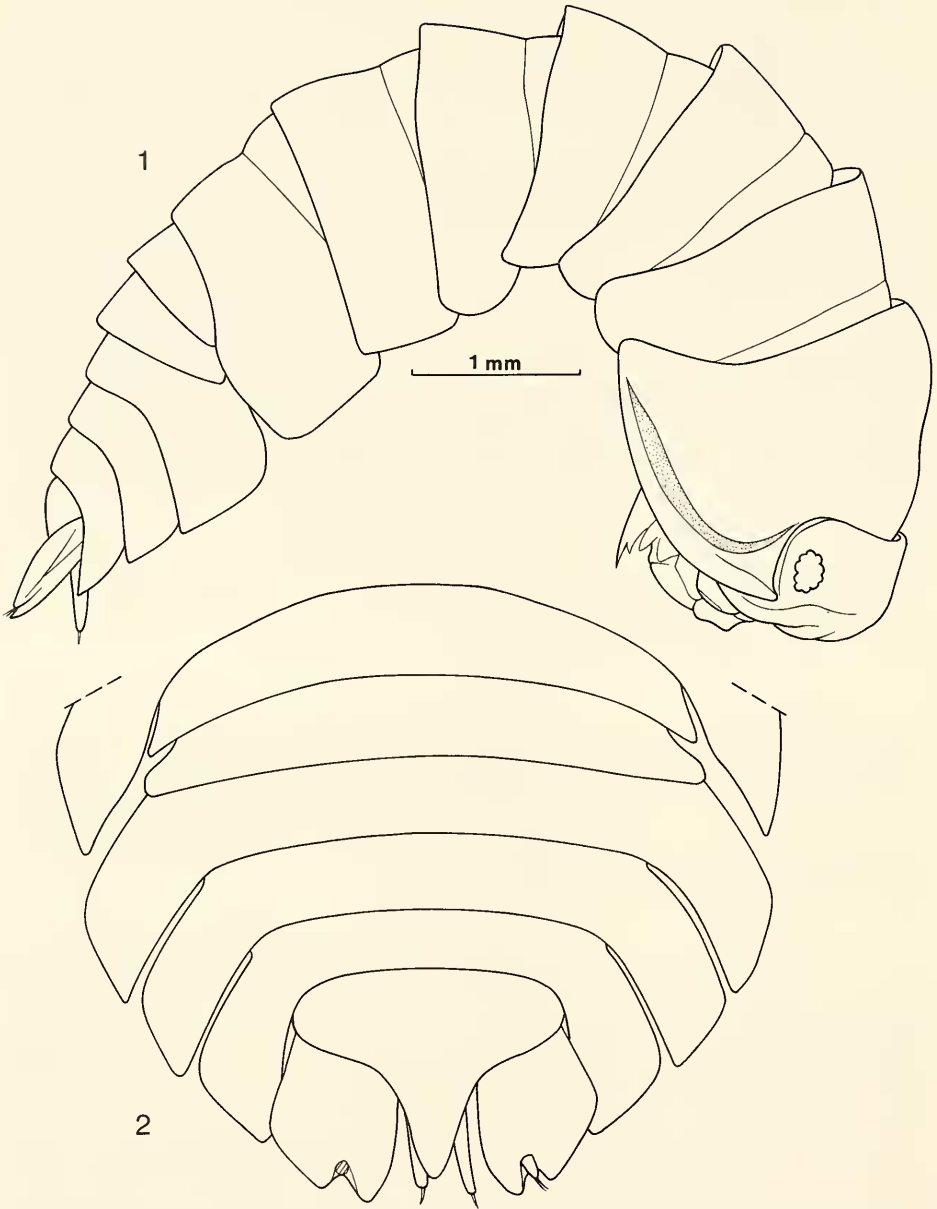
Description

Measurements: The holotype measures 7.5×2.8 mm. Biggest paratype specimen (♂) 9.0×5.0 mm.

Coloration: Holotype and paratypes from “Ein-Chadjet” except for normally pigmented eyes completely without pigmentation; the two specimens from the “Watiya Pass” have faint brownish marks on tergal parts.

Head in dorsal view with pointed frontal corners, frontal margin for nearly one third of the head width interrupted (figs. 3–4); eyes with 16 ommatidia arranged in four rows. Pereion-epimera I with lateral thickening disappearing a short distance before the posterior angle, sulcus arcuatus deep and wide, anteriorly regularly curved inwards, turning 90° and ending at the medial part of the frontal margin of the tergite (fig. 5); lateral margin of epimeron regularly convex, without indentation. Telson with distal part narrowly triangular, tip in situ not reaching inner angles of uropod-protopodites (fig. 6). Antenna with proximal segment of flagellum longer than distal one (fig. 7). Uropod-protopodite sub-quadrangular, postero-medial angle with pointed projection surpassing the minute exopodite (fig. 6).

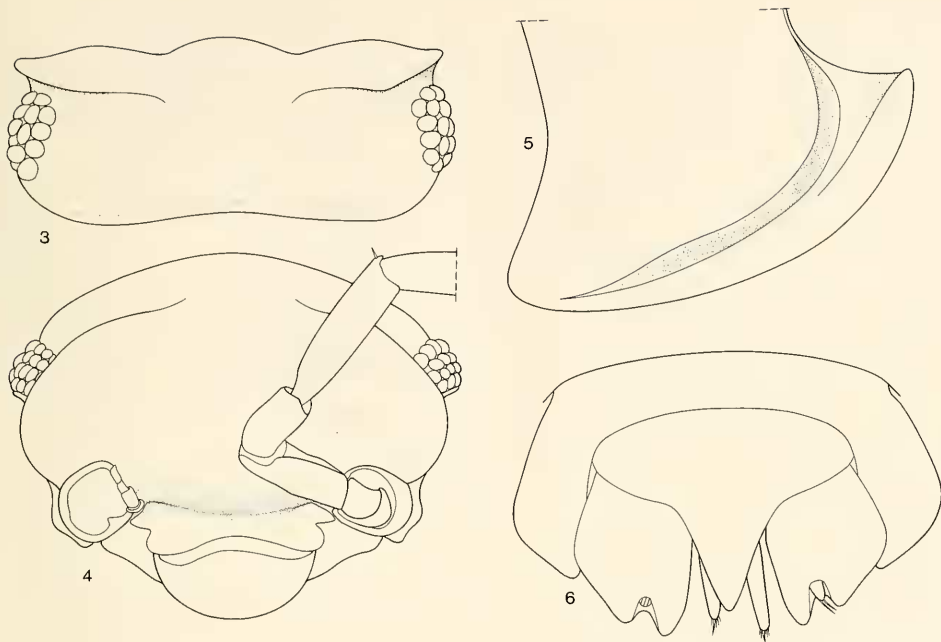
Male: Carpus I–III with brush of pointed spines, merus I with short brush of spines on the distal fourth of the segment (fig. 8). Ischium VII with frontal surface



Figs. 1-2. *Periscyphis albus* n. sp., holotype ♂, 7.5 × 2.8 mm (Israel, 12 km NW Elat). - 1. Whole animal, lateral view; - 2. pleon in dorsal view.

excavated and ventral margin concave with a faint angle in the proximal part, carpus VII not enlarged and without distal projections (fig. 9). Pleopod-exopodite I with rounded medial lobe (fig. 10), endopodite I with very pointed acute apex slightly directed outwards (figs. 11-12). Exopodites II and III see figs. 13-14.

The new species differs from *P. convexus* by the lacking or very faint pigmentation, the completely interrupted frontal margin, the male ischium VII with a clear



Figs. 3–6. *Periscyphis albus* n. sp., holotype ♂. – 3. Head in dorsal view; – 4. head in frontal view, right antenna removed; – 5. lateral view of pereion-epimere I; – 6. pleon-tergite V, telson and uropods in dorsal view.

ridge bordering the frontal concavity, the male pleoped-exopodite I with rounded instead of triangular medial lobe and the male pleopod-endopodite I with apex evenly tapering to the point which is only slightly turned outwards. Altogether *P. albus* n. sp. has more slender pereiopods and antennae than *convexus*. From *P. subtransversus* it differs, among other characters, by the longer sulcus arcuatus. *P. albescens* and *P. libycus* from Libya differ from *P. albus* by a very narrow sulcus arcuatus (compare fig. 42 in OMER-COOPER 1926: 377 and fig. 1 in ARCANGELI 1934).

3.3. *Periscyphis convexus* (Budde-Lund, 1885)

Cercocytonus convexus: BUDDE-LUND 1885: 44;

COLLINGS 1914: 209.

Peryscyphis (sic) *convexus*: BUDDE-LUND 1885: 293.

Periscyphis convexus: BUDDE-LUND 1909: 9, plate I, figs. 20–25;

STEBBING 1908: 560, plate XXVII, figs. C;

OMER-COOPER 1926: 389, figs. 62–67;

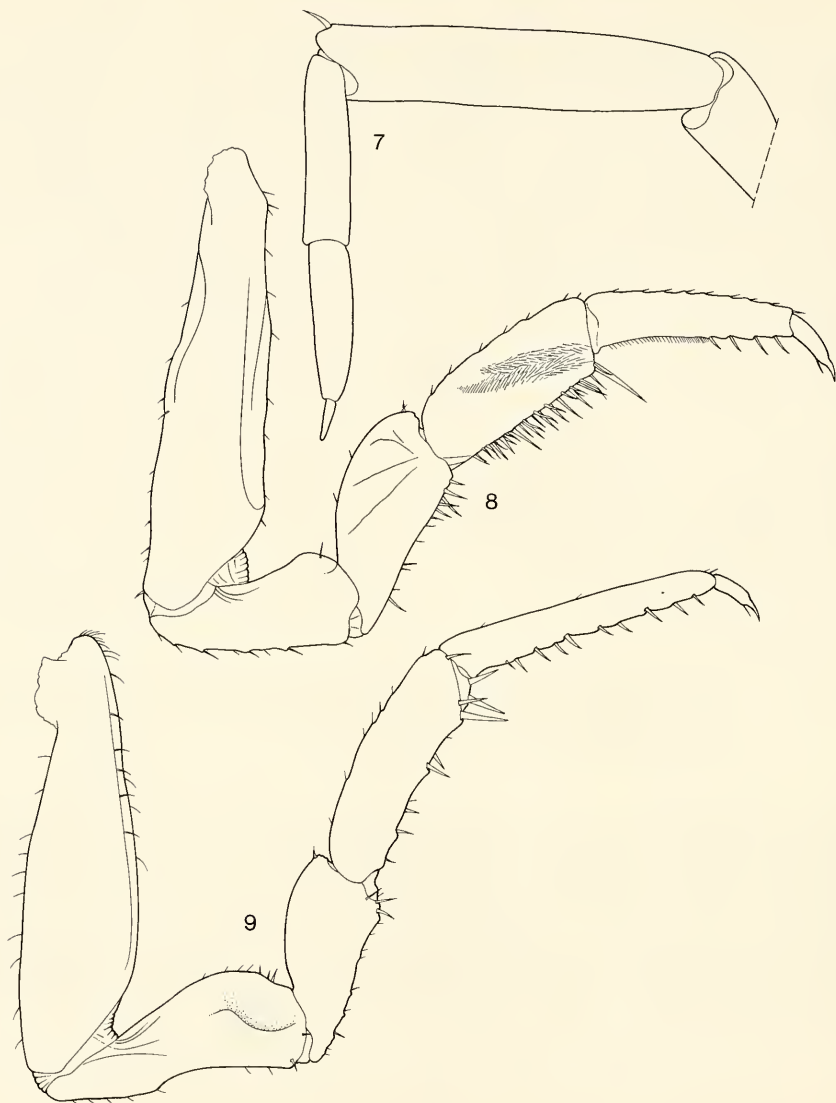
PAULIAN DE FÉLICE 1945: 342;

STROUHAL 1965: 625, fig. 16;

FERRARA & TAITI 1979: 136.

Material examined

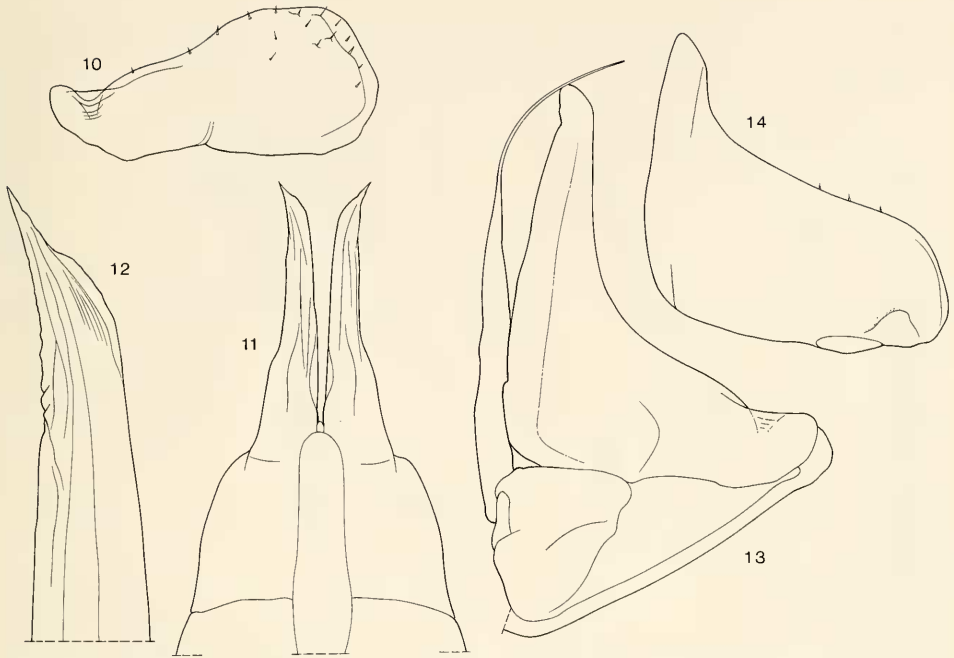
Egypt: 3 ♂♂, 2 ♀♀ without marsupium, Abu Simbel 250 km S of Assuan, shore of the lake, leg. RÄHLE 13. III. 1989, (SMS 15374); – 3 ♂♂, 4 ♀♀, “Egypt” without specified locality, BUDDE-LUND collection (redescribed by OMER-COOPER 1926; BML 1921.X.18.1296–1302);



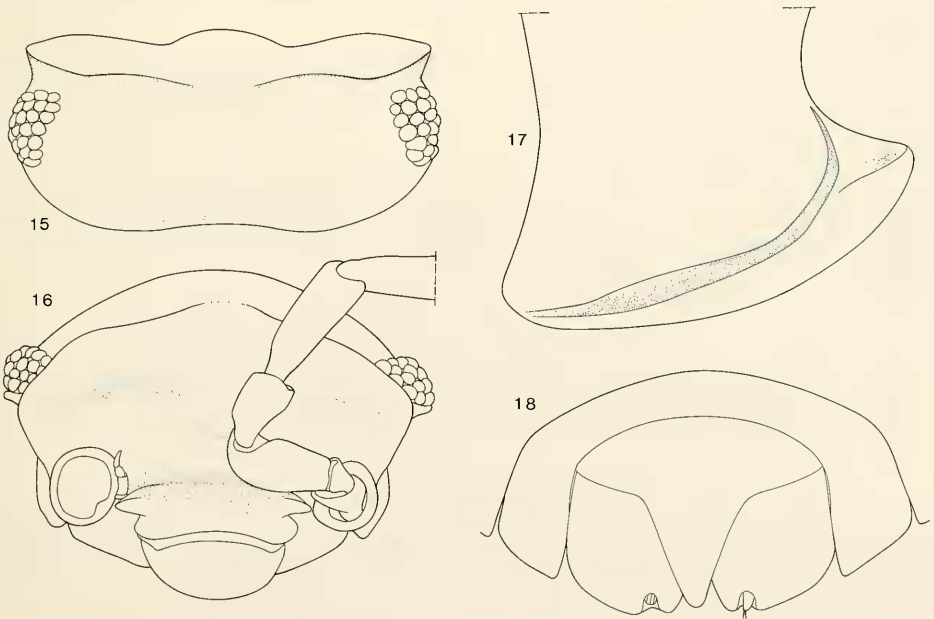
Figs. 7–9. *Periscyphis albus* n. sp., holotype ♂. – 7. Distal part of antenna; – 8. pereopod I, frontal view; – 9. pereopod VII, frontal view.

Sudan: 19 specimens, surroundings of Wadi Halfa, Nile valley at the border of Egypt, leg. Nubien-Expedition des Naturhistorischen Museums Wien 31. I.–11. II. 1962 (NHW, published by STROUHAL 1965);

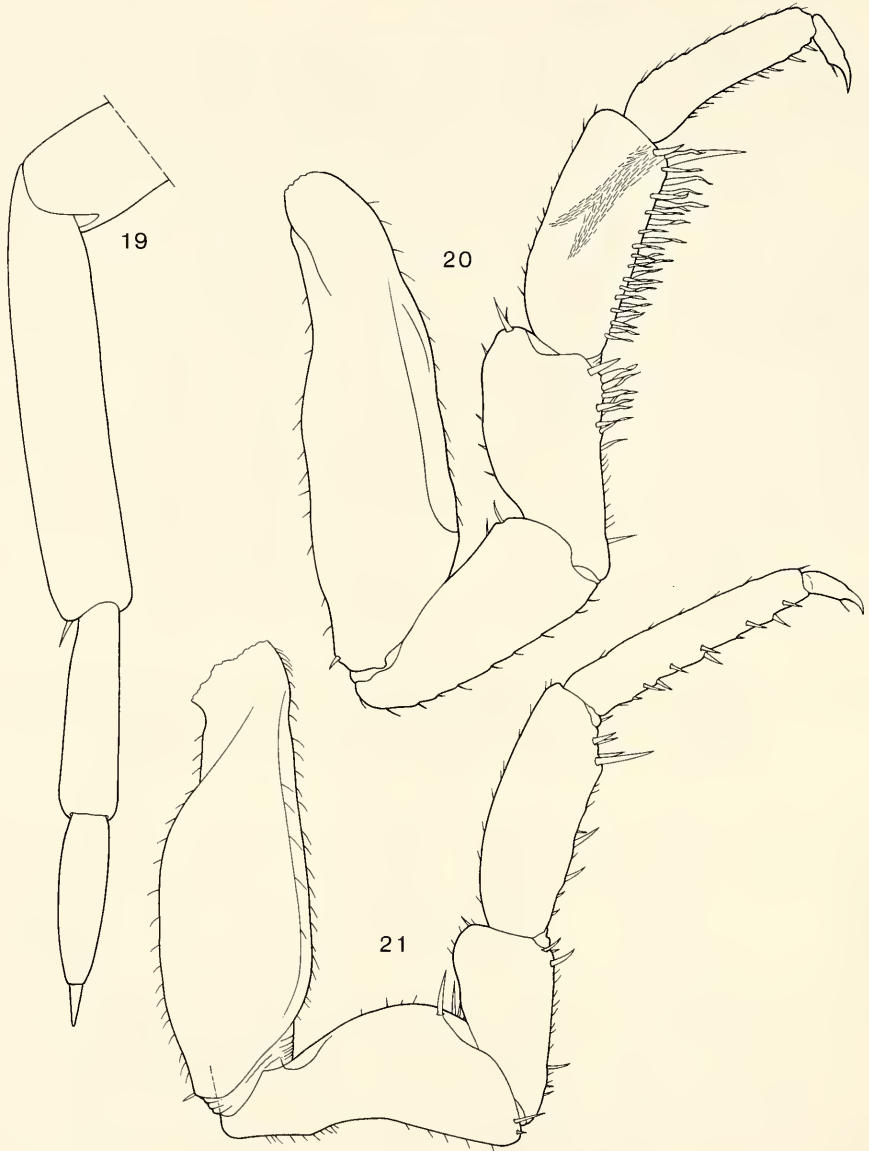
? Tanzania: "Birket el Qurun", leg. "Third Tanganyika Expedition, conducted by Dr. W. A. CUNNINGTON, 1904–1905" (4 ♀♀ in poor condition, BML 1909.5.1:27–27, published by STEBBING 1908).



Figs. 10–14. *Periscyphis albus* n. sp., holotype ♂. – 10. Pleopod-exopodite I, ventral view; – 11. pleopod-endopodite I, ventral view; – 12. pleopod-endopodite I, apex enlarged; – 13. pleopod II, dorsal view; – 14. pleopod-exopodite III.



Figs. 15–18. *Periscyphis convexus*, ♂, 7.5 × 3.2 mm (Egypt, Abu Simbel). – 15. Head in dorsal view; – 16. head in frontal view, right antenna removed; – 17. pereion-epimer I, lateral view; – 18. pleon-tergite V, telson and uropods in dorsal view.



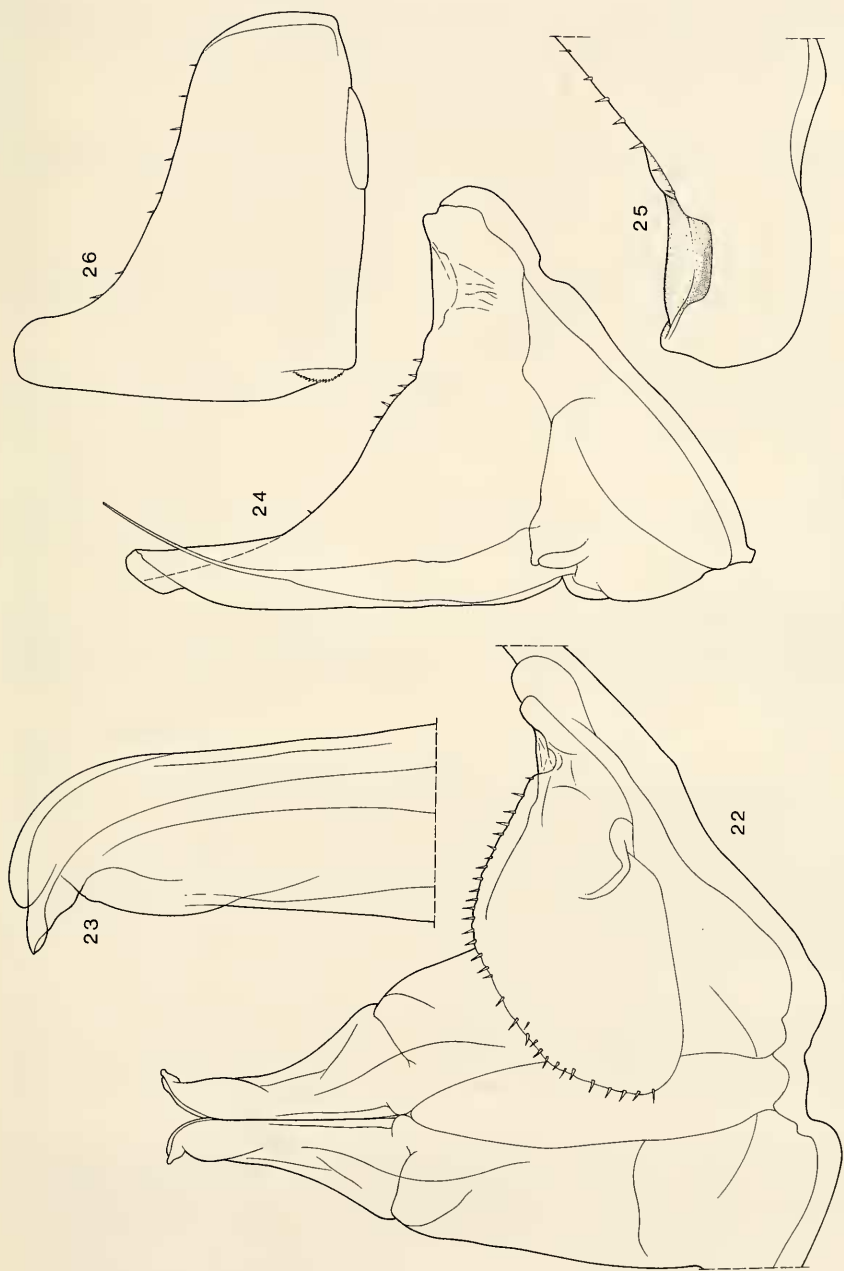
Figs. 19–21. *Periscyphis convexus*, ♂ as fig. 15. – 19. Distal part of antenna; – 20. pereiopod I, frontal view; – 21. pereiopod VII, frontal view.

Distribution (see map fig. 28)

Egypt: Luxor; Assiut; Philae; Assuan; Karnak; between Luxor and Assuan (BUDDE-LUND 1909); Abu Simbel 250 km S of Assuan (new record).

Sudan: Nubia, surroundings of Wadi Halfa [Abd el Quadir; second Nile Cataract; Sarra Ost: STROUHAL (1965), specimens, re-examined by the present authors].

? Djibouti: Obock (locality indicated by OMER-COOPER (1926) without any further collecting data; so this record remains doubtful and needs confirmation).



Figs. 22-26. *Periscyphis convexus*, ♂ as fig. 15. - 22. Pleopod I, lateral view; - 23. pleopod-endopodite I, apex enlarged; - 24. pleopod II, dorsal view; - 25. pleopod-exopodite I, lateral view; - 26. pleopod-exopodite III.

? Tanzania: Birket el Qurun (STEBBING 1908). We have re-examined these specimens, and as far as it can be judged from females there are no differences towards the Egyptian specimens.

It seems, however, somehow questionable that a species is distributed from Egypt to Tanzania across all the climatic zones of Africa, so we think this record from Tanzania needs confirmation by male specimens before it should be considered as safe.

Redescription

Measurements: The biggest specimen of investigated material, a ♀ without marsupium, measures 8.5×3.7 mm, the biggest ♂, of which the figures are taken, 7.5×3.2 mm.

Coloration: Head with dark frons and frontal margin, caudal vertex without pigmentation. Pereion-tergites whitish, with the central parts, posterior margins and bases of epimera dark brown. Pleon dark brown, with anterior area of epimera without pigmentation. Basal parts of telson and uropods colorless.

Head with frontal margin very faint in the middle, but not completely disappearing as in the preceding species (figs. 15–16), bulbous profrons protruding forwards. Pereion-epimera I with lateral thickening and sulcus arcuatus almost reaching posterior angle, sulcus arcuatus deep and wide, anteriorly bent inwards as in the preceding species (fig. 17), lateral margin of epimeron regularly convex without indentation. Telson with distal part triangular and narrowly rounded apex nearly reaching the posterior angles of the uropods (fig. 18). Antenna with proximal segment of flagellum slightly longer than the distal one (fig. 19). Pereiopods stouter than in the preceding species. Uropods with protopodite sub-quadrangular (fig. 18), inner angle can be elongated as in *P. albus* (compare fig. 16 in STROUHAL 1965: 625 – we have re-examined the figured specimen).

Male: Pereiopods I–III with brush of twisted setae on carpus and distal part of merus (fig. 20). Ischium VII with ventral margin concave and regularly rounded dorsal margin, merus VII with protuberance on dorsodistal margin (fig. 21); pleopod-exopodite I with triangular medial part equipped with a number of strong spines (fig. 22), endopodite I with distal part apically with bulbous enlargement, abruptly bent outwards at a nearly right angle (fig. 23); pleopod-exopodite II with a distinct torsion of the distal end (fig. 24); exopodite III has a small dentated lobe on medio-proximal margin (fig. 26).

3.4. *Periscyphis subtransversus* Omer-Cooper, 1926

Periscyphis subtransversus: OMER-COOPER 1926: 392 ff, figs. 68–73.

Material examined

Syntypes: 3 mutilated specimens, male pereiopods VII and pleopods missing, "Egypt" with a question-mark in the original description (BML 1921.X.18.1340–1342, BUDDE-LUND collection).

Remarks

The type-specimens seem to have been identified by BUDDE-LUND as *P. convexus*. There are, however, clear differences in the pereion-epimere I (fig. 27) and in the

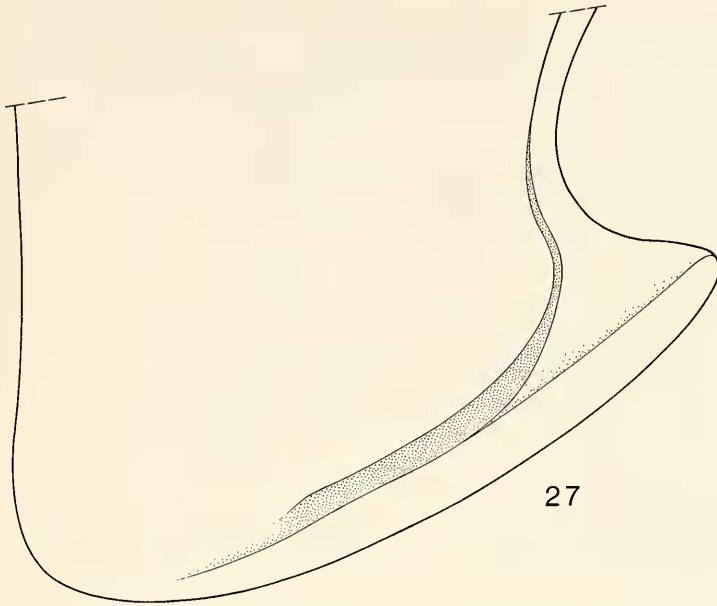


Fig. 27. *Periscyphis subtransversus*, mutilated syntype specimen, pereion-epimere I, lateral view.

shape of the telson (male appendages were missing in the specimens we have re-examined), so we consider *subtransversus* a species definitely distinct from *convexus*. The poor condition of the specimens, the lacking male appendages, and the missing type locality prevent us to give a full redescription.

4. Identification key for the species of *Periscyphis* known from Egypt, Israel and the Arabian Peninsula

This key is an updated version of the key given by TAITI & FERRARA (1989), supplemented by the subsequently described species *P. insularis* Ferrara & Taiti, 1988, *P. omanensis* Taiti & Ferrara, 1991, *P. albomarginatus* Taiti, Ferrara & Allspach, in press, the Egyptian species *P. convexus* (Budde-Lund, 1885), *P. subtransversus* Omer-Cooper, 1926 and *P. albescens* (Budde-Lund, 1885), and the new species *P. albus*. The species *erythraeus* and *bicoloratus* are excluded since they have in the meantime been ascribed to the genus *Xeroniscus* Ferrara & Taiti, 1990.

- 1 Head with frontal margin continuous 2
- Head with frontal margin absent or interrupted in the middle 5
- 2 Lateral margin of pereion-epimeron I indented *P. arabicus*
- Lateral margin of pereion-epimeron I not indented 3
- 3 Male carpus VII distinctly enlarged, about 1.5 times as long as wide *P. minor*
- Male carpus VII not enlarged, more than twice as long as wide 4
- 4 Male carpus VII with a conspicuous distal process equipped with two strong spines *P. barnardi*
- Male carpus VII with a minute distal process lacking strong spines *P. omanensis*
- 5 Pereion-epimeron I without sulcus arcuatus *P. vittatus*

- Pereion-epimeron I with more or less developed sulcus arcuatus 6
- 6 Lateral margin of pereion-epimeron I indented *P. buettikeri*
- Lateral margin of pereion-epimeron I not indented 7
- 7 Male ischium VII dorsally enlarged, distally forming an angle of less than 90° *P. albescens*
- Male ischium VII dorsally not enlarged, with an angle of more than 90° 8
- 8 Sulcus arcuatus visible only in the frontal half of epimeron I 9
- Sulcus arcuatus visible for more than half of the length of epimeron I 11
- 9 Distal part of telson spatulate with broadly rounded apex *P. besi*
- Distal part of telson with acute apex 10
- 10 Sulcus arcuatus bent inwards at anterior angle of epimeron *P. insularis*
- Sulcus arcuatus straight, not turning inwards *P. albomarginatus*
- 11 Sulcus arcuatus not bent inwards at anterior angle of epimeron 12
- Sulcus arcuatus bent inwards at anterior angle of epimeron 13
- 12 Telson with broadly rounded apex, male carpus VII enlarged *P. laticarpus*
- Telson with narrowly rounded apex, male carpus VII not enlarged *P. felix*
- 13 Deep impression of sulcus arcuatus reaching two thirds back on pereion-epimeron I (fig. 27) *P. subtransversus*
- Deep impression of sulcus arcuatus reaching four fifths back on pereion-epimeron I (figs. 5, 17) 14
- 14 Apex of male pleopod-endopodite I abruptly bent outwards at a right angle *P. convexus*
- Apex of male pleopod-endopodite I with a long acute point, only slightly curved outwards *P. albus* n. sp.

5. Abbreviations

BML = The Natural History Museum, London, England;

NHW = Naturhistorisches Museum Wien, Austria;

SMNS = Staatliches Museum für Naturkunde Stuttgart, Germany;

TBH = Technion – Israel Institute of Technology, Department of Biology, Haifa, Israel.

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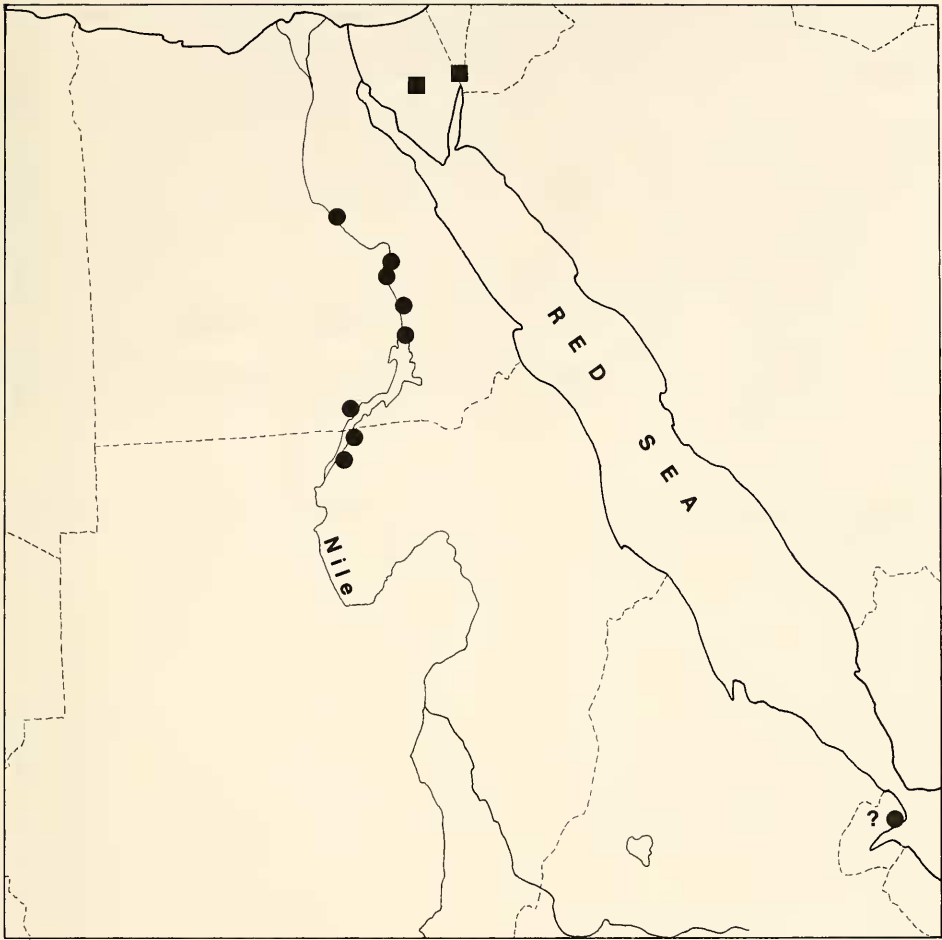


Fig. 28. Records of *Periscyphis albus* n. sp. (squares) and *P. convexus* (circles). The samples of *P. albus* from Sinai cannot be exactly located, the record of *P. convexus* from Djibouti needs confirmation.

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